



# High Availability RIS/PACS Solution redesigns the way Radiology works

Memorial Hospital in Istanbul, Turkey

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# “The path of integration for the future goes through PACS.”

Founded in 1996, Memorial Health Group (MHG) is a highly respected health organization in Istanbul, Turkey. The growing organization’s affiliates include Memorial Hospital, Suadiye Polyclinic, Etiler Polyclinic, Suadiye Memorial Surgery Center and Memorial Atasehir Hospital. As part of MHG, Memorial Hospital in Istanbul opened its doors in 2000.

By focusing on offering high quality services through its innovative approach, Memorial Hospital has established itself as one of the top healthcare institutions in Turkey, as well as in the world. Memo-



Dr. Kismet Kuzucu, Chief of Radiology at Memorial Hospital

rial Hospital is the first health institution in Turkey and 21st in the world to receive – and in 2005 to renew – the JCI (Joint Commission International) accreditation certificate. Many of MHG’s departments, including Cardiology, IVF and Organ Transplantation, serve as leaders in their specialty areas and have gained international recognition. MHG aims to convert the main hospital complex to a Center of Excellence supported by smaller hospitals around different districts of Istanbul. As part of their innovative approach, MHG and Memorial Hospital are collaborating closely with Siemens Medical Solutions in developing a state-of-the-art Radiology Department.

## The Challenge: Further increase quality of services and efficiency of workflow

At the beginning of 2006, Memorial Hospital appointed Dr. Kismet Kuzucu, former user of SIENET Magic with a vast amount of experience in digital radiology, to Chief of the Radiology Department. Dr. Kuzucu’s list of goals was a long one: to develop a Radiology Department with the latest technology available, to increase quality and number of healthcare services, to increase workflow efficiency and thus prepare MHG for the future.

“The path of integration for the future goes through PACS,” said Dr. Kuzucu.



“Memorial Health Group has undergone an investment to totally renew its Radiology Department including PACS (Picture Archiving and Communication System). Global and country trends in radiology make image management solutions more and more important. The Ministry of Health, based on the new Private Hospital Bi-law, requires 20-year obligatory archiving of images. This can be achieved only with digital archives. In order to keep ahead of competition, fast and efficient workflow is necessary.”

MHG conducted extensive vendor evaluations, and in the end of 2006 chose to collaborate with Siemens to implement its integrated IT solution syngo® Suite as well as new medical equipment.

“We were looking for a highly integrated and functional PACS and RIS (Radiology Information System) solution from one vendor that would enable efficient workflow, multi-site reporting and digital archiving. Since the project included both modalities and PACS, we looked for a vendor that could offer a complete solution in order to expedite the time of implementation,” explained Dr. Kuzucu.



**The Solution:  
Implementation of the syngo Suite  
and state-of-the-art equipment**

The highly integrated *syngo* Suite solution for RIS/PACS and post-processing covers the complete workflow inside the Radiology Department from order placement to image archiving and distribution. It integrates the complete image management workflow to a unified work environment helping to enable efficient workflow that supports the entire electronic radiology order process.

In order to leverage the full array of the benefits that *syngo* Suite offers, extensive network planning was conducted. The project teams from Memorial Hospital and Siemens worked closely together in planning and executing on an implementation strategy. The Radiology Department was expanding, and Memorial Hospital did not want to interrupt operations. Therefore, a multi-phase implementation model was developed. The first phase focused on the installation of the new equipment. The second phase involved the installation of the network infrastructure, including disaster

**Hospital profile  
Memorial Hospital in Istanbul, Turkey**

**General Information:**

- Private Hospital
- No. of beds: 160
- No. of employees: 1,200
- No. of radiologists: 6
- No. of exams per year: 50,000
- Image data per year: 2 TB

**Sites:**

Memorial Hospital,  
Memorial Atasehir Hospital,  
Memorial Suadiye Clinic,  
Memorial Etiler Clinic

**Installed Systems  
(Memorial Hospital):**

- *syngo* Imaging
  - 7 *syngo* Studio Advanced
  - 5 *syngo* Imaging XS Clients
  - 2 *syngo* Studio  
(Operation Room Review)

- *syngo* Workflow
  - 30 client PC's
  - Speech Magic
  - OPENLink
- *syngo* Special Workplaces
  - *syngo* Imaging XS Digitizer
  - *syngo* Imaging XS CD/DVD  
Robotics Rimage 2000i
- *syngo* Imaging XS  
Server and Client
- 4 TB short term storage;  
20 TB long term archive

**Modalities include:**

MAGNETOM Avanto, Iconos R200,  
MAMMOMAT NovationDR, MULTIX  
PRO, MULTIX TOP, 2 MOBILETT XP  
HYBRID, 2 POLYMOBIL, 3 US ACUSON  
Antares, MammoReport Workstation,  
SOMATOM Sensation 64,  
AXIOM Artis DFA

recovery. This was then followed by the final phase – installing and implementing the *syngo* Suite solution.

A separate network infrastructure dedicated to the *syngo* Suite was integrated to the hospital network infrastructure. High availability and disaster recovery strategies were among the main requirements of the archiving implementation. Two separate archive server rooms were designed: one serves as the main data center and the other serves the long term archive. This approach helps to ensure high availability of the system.

Digital radiology and image management solutions require technology adaptation. Throughout the hospital, computers were updated or added, operation rooms were equipped with special OR mobile devices and special units, such as Emergency, Orthopedics and Neurosurgery, were set up with high-resolution web access workstations.

The Radiology Department executives recognized that the implementation of new technologies could cause some resistance from staff members who were used to old systems and processes. To help overcome this potential obstacle, comprehensive training sessions for all facility members were conducted. It was important to properly communicate why the changes were being made, what benefits the new solutions would bring, and to introduce the new technologies and processes.

*“syngo* has an intuitive user interface that is very easy to learn,” said Dr. Kuzucu. *“The common syngo* language helps users to learn fast, adapt quickly, and it enables a seamless PACS transition with an extremely short training process.” In order to keep all users trained and supported, the *“Train the Trainer”* model was adopted for the training of all clinicians and nurses at Memorial Hospital. *“Not only the software but also the complete image management solution, together with its benefits to Memorial Hospital and the clinicians, were presented in the training sessions. With this approach, the system has gained fast acceptance. The clinicians are motivated to use it for their daily routines,”* said Dr. Kuzucu.



*“The common syngo* language helps users to learn fast, adapt quickly and it enables a seamless PACS transition with an extremely short training process”

**The Success:  
A whole new level of radiology workflow**

Shortly after implementation, Memorial Hospital is already experiencing the benefits of the *syngo* Suite. *syngo*® Workflow, *syngo*® Imaging and *syngo*® Imaging XS have helped to improve radiology processes and brought Memorial Hospital to a whole new level of workflow in radiology. With technologies such as the common *syngo* user interface, staff members are now seeing how radiology can flow. *“It is a tremendous advantage to use the syngo* user interface on each modality

and all *syngo* Suite workstations,” explained Filiz Özbek Yılmaz, Radiographer and RIS-PACS Manager. *“All the devices in our department were changed at the same time. However, because of the common syngo* user interface, all the technicians were able to adapt to the new system in a very short time. The DICOM Worklist functionality and the *syngo* Workflow access at each modality console workplace also enables us to improve our speed and our ability to retrieve useful information whenever needed.” *syngo* Studio workplaces, utilizing Siemens multiple *syngo* post-processing applications, increases the efficiency of diagnostic and

“The immediate availability of the diagnostic images substantially improves our patient care and throughput.”



therapeutic cycles, providing fast, intuitive and role-based access to information for the radiologists. As Radiologist Dr. Atilla Aslan pointed out: “I had doubts about digital workflow and reporting and the effect it would have on my work. However, now I am really happy to be working with the *syngo* Suite. It is a very user-friendly, fast and effective system. The immediate access to all patient relevant data – images and reports – with just a single mouse click helped tremendously to improve our diagnostic quality and throughput.”



Dr. Atilla Aslan M.D., Radiologist

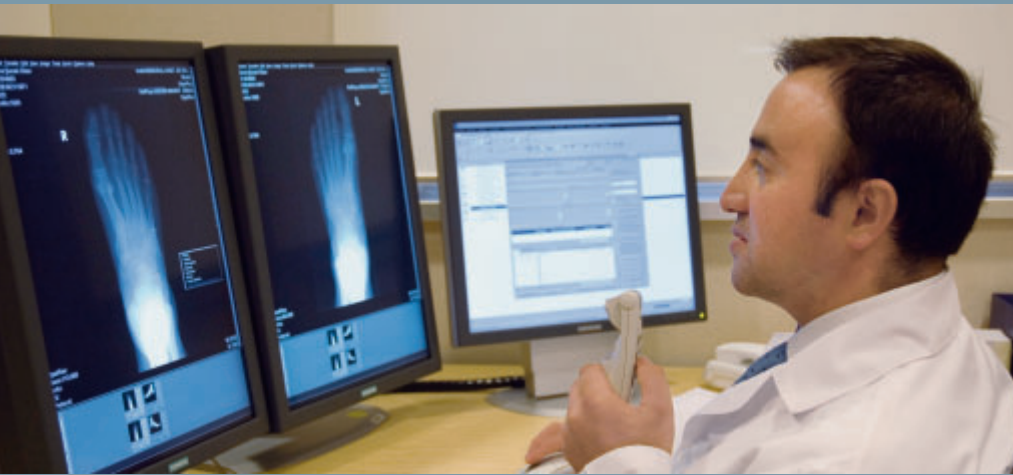
Filiz Özbek Yılmaz added that from a RIS-PACS management perspective, quick access to information plays an important part in the entire quality process: “For me, the most important advantage is the ability to monitor the processes of the Radiology Department in real time from most computers. As we are able to monitor several metrics related with the daily processes after a peak workload, we are able to pinpoint the real causes of the problems and as a result we often have the chance to improve the daily workflow.”

Another great improvement for Memorial Hospital is the ability to get images and reports quickly to the referring physicians throughout the entire hospital, including the operation rooms and intensive care units. This is made possible with *syngo* web-based Studio access. “The immediate availability of the diagnostic images substantially improves our patient care and throughput,” explained Dr. Kadir Doğruer M.D., Chief of the Intensive Care Unit. “It allows us to review the images together with our consultants.



Dr. Kadir Doğruer M.D., Chief of Intensive Care Unit

Supported by the most relevant images and expert advice, we are better able to make the right therapeutic decisions in the shortest time possible.” Dr. Kuzucu also appreciates the enhancements that have led to improved training and consultation: “Digital archives enable better professional training for our staff members. Closer collaboration and consultation with referring physicians and radiologists is now possible through the ability to access the same images and reports from everywhere in the hospital, even outside of the hospital.”



Dr. Yusuf Sahingoz, M.D. is able to generate reports much more efficiently.

The benefits that Memorial Hospital is experiencing are as multifaceted as the *syngo* Suite. "All the staff members in our department – radiologists, radiographers, front desk personnel and typists – benefit from these technologies," said Dr. Kuzucu. "The quality of their working environment has increased. And our overall time to generate reports has shortened, making it possible for us to increase our load capacity while keeping the same staff. This is one of the main benefits that the *syngo* Suite brings." *syngo* Workflow specifically contributes to improvements towards the management and administration of the Radiology Department. Scheduling and planning have become more efficient through the *syngo* Workflow scheduling module, resulting in better appointment and scheduling planning, as well as equipment utilization. Previously, scheduling was time-consuming, involving many phone



Dr. Nazan Cihan, M.D. appreciates features such as SmartSelect™ for comfortable reading.

calls: it was done manually on paper by the radiographers at the modalities. The front desk did not have online access to the information. Now with the new system, all examinations are properly registered. Prior to the implementation of the *syngo* Suite solution, it was possible that reports for certain examinations were not created or were missing – ending in time-consuming searching. In particular, sometimes films of emergency cases that were given to patients were no longer accessible, at least until the patient

returned it. These challenges are fortunately now a thing of the past. As MHG is in the process of opening a new site, Atasehir Hospital, in 2008, planning for a multi-site expansion of the *syngo* Suite is underway. An adaptation of medical equipment for polyclinics is planned in order for them to be compatible with the digital radiology and integrated into the digital archive as well as the current *syngo* Suite. Web access over the entire hospital network will continue to expand: "Currently the staff members most frequently using our radiology services are the ones using web distribution. The next step will be to move towards a completely filmless hospital where films are no longer produced," said Dr. Kuzucu.

By choosing the *syngo* Suite, Memorial Hospital has established a complete digital Radiology Department, bringing the hospital one step further in their overall expansion plans. *syngo* Suite plays an important role in helping MHG achieve its goal of providing high quality healthcare services, while increasing confidence in patients. MHG recognizes the benefits of the *syngo* Suite and sees the value-add to its mission: "Siemens continues to develop the *syngo* Suite by adding functionalities that help improve our workflow. The role-based approach for access to information, new portals, especially portals for radiologists and administration, will bring even more value to our department," added Dr. Kuzucu.

"The role-based approach for access to information, new portals, especially portals for radiologists and administration, will bring even more value to our department."





Radiologists, radiographers, front desk personnel and typists all benefit from the IT technology.

### The Challenge

- Developing a Radiology Department with the latest technology available
- Increasing workflow efficiency, thus preparing MHG for the future
- Finding a vendor that could offer a complete solution and support the hospital's objectives

### The Solution

- Implementation of the *syngo* Suite and state-of-the-art medical equipment from Siemens
- Close collaboration in planning and executing on an implementation strategy
- Deployment of a High Availability system
- Technology adaptation throughout the entire hospital
- "Train the Trainer" model for user training

### The Success

- Easy adaptation to the new system through common *syngo* user interface
- Access from every modality helps improve workflow efficiency
- Ability to monitor the processes in real time helps to improve the daily workflow
- Immediate availability of diagnostic images supports improvements in patient care
- Closer collaboration and consultation with referring physicians and radiologists
- Increased quality of the working environment
- Greater efficiency in scheduling and planning
- Bringing the hospital one step further in the overall plan of expansion

◀ "RIS-PACS implementations are complex in their nature and require close team work with all involved parties. Siemens acts not only as our solution provider but also as our partner, taking an active role in optimizing our workflow."  
Dr. Kismet Kuzucu, Chief of Radiology at Memorial Hospital

"Digital radiology with *syngo* Suite has redefined our style of working."  
Filiz Özbek Yılmaz, Radiographer and RIS/PACS Manager ▶



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